

Claims

- [c1] 1. A method for protecting an article from degradation, said method comprising:
providing a substrate;
providing a Plasma Transferred Arc (PTA) apparatus;
setting said PTA apparatus to operate in a non-transferred arc mode; and
disposing at least one coating on said substrate using said PTA apparatus in said non-transferred arc mode.
- [c2] 2. The method of claim 1, wherein disposing said at least one coating comprises operating said PTA apparatus using a pilot arc power supply to dispose said at least one coating.
- [c3] 3. The method of claim 1, further comprising welding said substrate using said PTA apparatus in a transferred arc mode to form a welded region on said substrate prior to disposing said at least one coating on said substrate using said PTA apparatus in said non-transferred arc mode.
- [c4] 4. The method of claim 3, wherein disposing said at least one coating comprises disposing said coating on said welded region of said substrate.
- [c5] 5. The method of claim 1, wherein providing said substrate comprises providing a substrate comprising at least one of a metal, a ceramic, and a plastic.
- [c6] 6. The method of claim 5, wherein providing said substrate comprises providing a substrate comprising an alloy, said alloy comprising at least one of nickel, cobalt, iron, aluminum, and stainless steel.
- [c7] 7. The method of claim 1, wherein providing said substrate comprises providing a component of a gas turbine assembly.
- [c8] 8. The method of claim 7, wherein providing said component comprises removing said component from said turbine assembly.
- [c9] 9. The method of claim 7, wherein disposing said at least one coating comprises disposing said at least one coating on said component wherein said component is coupled to said gas turbine assembly.

- [c10] 10.The method of claim 1, wherein disposing said at least one coating comprises using a feedstock material in a form selected from the group consisting of powder, wire, rod, sheet, paste, and combinations thereof.
- [c11] 11.The method of claim 1, wherein disposing said at least one coating comprises disposing at least one of a metal and a ceramic.
- [c12] 12.The method of claim 11, wherein disposing said at least one coating comprises disposing a bond coat material.
- [c13] 13.The method of claim 12, wherein disposing said bondcoat material comprises disposing a material comprising MCrAlX-type material, wherein M is at least one of nickel, cobalt, and iron, and wherein X is at least one of yttrium and zirconium.
- [c14] 14.The method of claim 12, wherein disposing said bondcoat material comprises disposing material comprising an aluminide compound.
- [c15] 15.The method of claim 11, wherein disposing said at least one coating comprises disposing a thermal barrier coating.
- [c16] 16.The method of claim 15, wherein disposing said thermal barrier coating comprises disposing a material comprising yttria-stabilized zirconia.
- [c17] 17.A method for protecting an article from degradation, said method comprising:
providing a substrate;
providing a PTA apparatus;
welding said substrate using said PTA apparatus in a transferred arc mode to form a welded region on said substrate;
setting said PTA apparatus to operate in a non-transferred arc mode; and
disposing at least one coating on said welded region of said substrate using said PTA apparatus in said non-transferred arc mode, wherein said PTA apparatus is operated using a pilot arc power supply to dispose said at least one coating.
- [c18] 18.A method for in-situ repair of a component of an assembly, said method

comprising:

providing a substrate, said substrate comprising a component of an assembly and coupled to said assembly;

providing a PTA apparatus;

welding said substrate using said PTA apparatus in a transferred arc mode to form a welded region on said substrate;

setting said PTA apparatus to operate in a non-transferred arc mode; and

disposing at least one coating on said welded region of said substrate using

said PTA apparatus in said non-transferred arc mode, wherein said PTA

apparatus is operated using a pilot arc power supply to dispose said at least one coating.